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Patent Claims

1. A fuel tank with ventilation system, wherein the fuel tank (1) has a filler pipe (5) comprising a filler neck (6), with refueling sensor (7), and a liquid level sensor (13), and the ventilation system comprises an activated carbon filter (24) which, on the one hand, is connected by a first line (22) to a vapor space of the fuel tank (1) and by a second line (25) to the induction tract of an internal combustion engine, and, on the other hand, by a third line (26) to the atmosphere, characterized in that there is provided:

a) a controlled two-way valve unit (23), whereof the first path connects the first line (22) to the third line (26) and the second path connects the second line (25) to the third line (26),

b) an electronic control unit (28), which on the input side is connected to the refueling sensor (7) and to the liquid level sensor (13) and on the output side is connected to the controlled two-way valve unit (23).

2. The fuel tank with ventilation system as claimed in claim 1, characterized in that the two-way valve unit (23) opens up the first path when the refueling sensor (7) indicates a refueling situation and when the fill level sensor (13) indicates a value below a specific fill level; and closes off the first path once the specific fill level is reached, and in that the two-way valve unit opens up the second path when the activated carbon filter (24) is due to be scavenged.

3. The fuel tank with ventilation system as claimed in claim 2, characterized in that the two-way valve unit, after the specific fill level has been reached, closes off the first path for a specific period and then reopens it.

4. The fuel tank with ventilation system as claimed in claim 1, characterized in that an automatic valve (21) is provided in the first line (22).

5. The fuel tank with ventilation system as claimed in claim 4, characterized in that the automatic valve (21) in the first line (22) is a rollover valve.

6. The fuel tank with ventilation system as claimed in claim 5, characterized in that the rollover valve (21) is provided in a separating vessel (14) provided in the tank (1)

and flow-connected to the inside of the fuel tank (1).

7. The fuel tank with ventilation system as claimed in claim 1, characterized in that at least one pipe (15) is run from the separating vessel (14) to a higher situated point inside the fuel tank (1), which pipe ends there with a slosh valve (16).

8. The fuel tank with ventilation system as claimed in claim 1, characterized in that the controlled two-way valve unit (23) is fitted to the activated carbon filter (24).

9. The fuel tank with ventilation system as claimed in claim 1, characterized in that the entire ventilation system (20) is fitted inside the fuel tank (1).

10. The fuel tank with ventilation system as claimed in claim 1, characterized in that the controlled two-way valve unit (23) comprises two valves (45, 46) accommodated in a common housing (40) and having closing bodies (47, 48), whereof the first (47) closes off or opens up the first path and the second (48) closes off or controllably opens up the second path.

11. The fuel tank with ventilation system as claimed in claim 10, characterized in that the housing (40) of the

controlled two-way valve unit (23) has three line connections (41, 42, 43) in T-arrangement, the line connections (41, 42) to the fuel tank (1) and to the internal combustion engine lying in a first common axis (44) and the line connection (43) to the third line (26) transversely thereto, and in that the two closing bodies (47, 48) are displaceable along a second common axis (44), the two axes (44) being at least parallel, and in that the first closing body (47) interacts with a valve seat (49) assigned to the first line connection (41) and the second closing body (48) interacts with a valve seat (50) assigned to the second line connection (42), each closing body (47, 48) boasting its own electric actuator (54, 55, 57, 58) and the closing directions of the two closing bodies (47, 48) being mutually opposed.

12. The fuel tank with ventilation system as claimed in claim 11, characterized in that, for the actuation of the first closing body (47), a magnetic coil (55), acting in the direction of opening, and a flip-flop spring (56) are provided and, for the actuation of the second closing body (48), a magnetic coil (58) is provided, which acts upon said second closing body, in a controllable manner in the direction of opening, counter to the force of a spring (59), the first valve (45) being brought into the closed setting once the second valve (46) is fully opened.

13. The fuel tank with ventilation system as claimed in claim 12, characterized in that the second valve (46) is coupled to the first valve (45) by mechanical persuasion of that end (70) of the second closing body (48) facing away from the second valve seat (50) onto that end (71) of the first closing body (47) facing away from the first valve seat (49).

14. The fuel tank with ventilation system as claimed in claim 1, characterized in that between the first line (22) and the third line (26) there exists a bypass (82, 87, 92, 85), in which a pressure-equalizing valve unit (80) is provided.

15. The fuel tank with ventilation system as claimed in claim 14, characterized in that the pressure-equalizing valve unit (80) contains an overpressure valve (87, 77, 89, 90) and an underpressure valve (83, 84), the overpressure valve having a closing element (88) which, on the one hand, is connected to the inside of the fuel tank (1) and, on the other hand, is connected to the atmosphere, and the underpressure valve (83, 84) being a nonreturn valve which opens in case of underpressure in the fuel tank (1) and closes in case of overpressure.

16. The fuel tank with ventilation system as claimed in

claim 15, characterized in that the pressure-equalizing valve unit (80) is structurally combined with the two-way valve unit (23).